no clinical evidence of metastatic growth. All of them were definitely enlarging, some at a relatively rapid rate when first seen. It is notable that the layman has been educated to the possible danger of moles that are growing, and as a result we are seeing more of these cases early in the curable stage.

CONCLUSIONS

1. Malignant melanoma may be cured if it is radically removed early enough in its course.
2. Either radical excision or thorough destruction by electrothermic means are acceptable forms of treatment.
3. The present pathologic criteria are not effective in judging the relative malignancy of an excised melanoma.

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THE ENDOMETRIUM IN MENSTRUAL DISTURBANCES OF THE CLIMACTERIC*

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THE term *climacteric* is used to designate the whole period of change in endocrine balance which takes place at the end of menstrual life. An important event at this time is the *menopause,* or cessation of the menses. This may occur abruptly, or it may be preceded by more or less marked irregularities in the intervals between bleeding episodes, or in the duration and amount of flow. The present study deals with the endometrial changes which occur in association with irregular uterine hemorrhage during the premenopausal period.

CLINICAL MATERIAL FOR THE STUDY

The material for this study was obtained from twenty climacteric clinic patients ranging in age from 38 to 52, with an average of 44½ years. In no case were gross pelvic lesions demonstrable.

A careful record of climacteric symptoms and menstrual or abnormal uterine bleeding was available, and an attempt was made to obtain from one to three endometrial biopsies from each patient. These were secured one to three days before the onset of bleeding, during the course of bleeding or, on three occasions, at the time of an expected flow which did not occur until three or four weeks later.

Among the twenty patients, one had continuous bleeding over a period of four months. The remaining nineteen exhibited periodic bleeding, but presented a wide variation in the length of the interval between bleeding episodes and in the amount and duration of flow. These variations were noted not only in individual patients, but also from period to period in a given patient. In only two instances was there any degree of regularity in the cycle.

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TABLE I.

ENDOMETRIAL BIOPSY.

Late stage of secretion	4
Early stage of secretion	1
Atypical stage of secretion	1
Stage of proliferation	4
Hyperplasia of endometrium	8
Atrophy of endometrium	2
TOTAL	20

One of these patients presented herself because of a marked increase in the amount of flow, and the other because of troublesome hot flushes for a few days before each menstrual period.

CLASSIFICATION OF BIOPSY SPECIMENS

A classification of the endometrial biopsy specimens is given in Table 1, and it is noted that they fall into four predominant groups: (1) Stage of secretion; (2) stage of proliferation; (3) hyperplasia of the endometrium; and (4) atrophy of the endometrium.

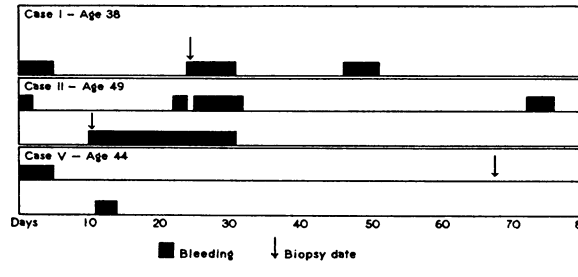
1. *Stage of Secretion.*—In four instances the endometrium presented the appearance of a normal stage of secretion (premenstrual phase), in a fifth the secretory changes were imperfectly developed, and in a sixth the endometrium undoubtedly belonged to this group, but there were a number of atypical features observable in the microscopic sections.

In five of the six patients the biopsy specimen was obtained just before or at the time of a period of bleeding, and it may, therefore, be assumed that ovulatory cycles were present.

Two of the cases presented unusual features (Fig. 1). In the first, there was a twenty-day bleeding episode from a normal stage of secretion. This clinical observation is in keeping with the condition of "irregular shedding of the endometrium," or "prolonged defective desquamation" recently described by Pankow,[1] Traut and Kuder.[2] Its exact significance is not known, but it may represent a local disturbance. At any rate, the abnormal bleeding usually responds readily to a curettage.

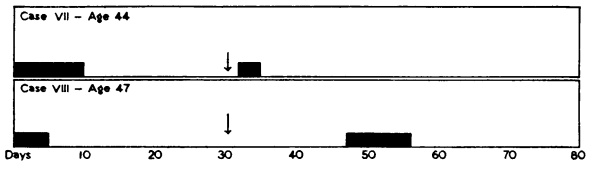
In the second, a somewhat atypical stage of secretion was noted in a biopsy specimen obtained on the fifty-seventh day of a ninety-day period of amenorrhea. The endometrium showed an extensive subnuclear vacuolization, with small piknotic

Fig. 1 – Secretion



Variation in cyclic bleeding from a Secretory Endometrium.

Fig. 2 – Proliferation



Variation in cyclic bleeding from a Proliferative Endometrium.
↓ Biopsy day.

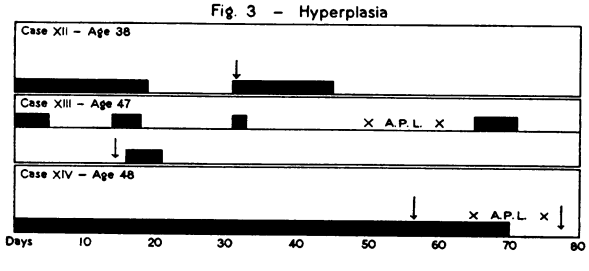
nuclei forced toward the lumina of the glands. Rock and Bartlett [3] cite one case in which a secretory endometrium was found, and later a proliferative phase with no demonstrable bleeding between the time of the biopsies. It is possible that a similar sequence of events occurred in this instance, but unfortunately no information is available as to the endometrium at the time of bleeding which occurred twenty-three days later. However, it is more likely that the corpus luteum persisted in an active stage during this time.

2. *Stage of Proliferation.*—This type of endometrium was observed in four instances. In two cases the bleeding did not occur until seventeen and twenty-eight days later, respectively. The information available, therefore, is of no value in interpreting the character of the cycle, except in so far as it denotes the ovarian process found in oligomenorrhea or infrequent menses (Fig. 2). However, in the other two instances the biopsy specimens were obtained two days before and with the onset of a "menstrual period," respectively, and may be considered as representing an "anovulatory menstruation."

3. *Hyperplasia of the Endometrium.*—It has long been recognized that the abnormal bleeding associated with "metropathia hemorrhagica" (Schroeder [4]) occurs from a type of endometrium known as "hyperplasia endometrii." In this series, as in almost all reports of abnormal uterine hemorrhage in the premenopausal epoch, it was the most frequent diagnosis and occurred in eight of the twenty patients. In one instance the biopsy was obtained during a four months' period of uterine bleeding, but the remainder reflected the endometrial picture in women with cyclic uterine hemorrhage (Fig. 3).

Metropathia hemorrhagica, with its accompanying hyperplasia of the endometrium, is a clinicopathologic entity and results from an ovarian dysfunction.[5] The uterine mucosa is stimulated by the hormone "estrogen" without the influence of the corpus luteum factor. It may be produced in a short time by the effect of large dosages of estrogen, or small ones over a long time. Since the estrogenic factor is so important in these cases, it is especially significant that none of these patients complained of the common climacteric symptom of hot flushes.

Fig. 3 – Hyperplasia



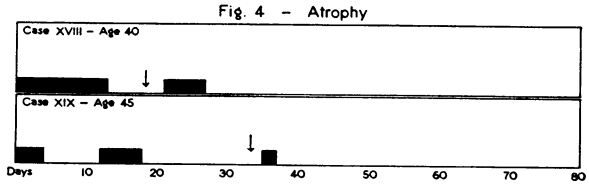
Variation in bleeding episodes from an Hyperplasia of the Endometrium.
↓ Biopsy day.

4. *Atrophy of the Endometrium.*—The fourth group is represented by two patients in whom the endometrium, at about the time of uterine bleeding, showed various degrees of atrophy (Fig. 4).

COMMENT

The small number of cases on which this study is based does not allow final deductions. It must be remembered, also, that the patients do not represent normal individuals, but a group who applied for treatment because of an abnormality, usually a disturbance in their menstrual experience. Nevertheless, certain observations point to a few important deviations from the normal menstrual cycle, which demand further investigation.

Fig. 4 – Atrophy



Variation in cyclic bleeding from an Atrophic Endometrium.
↓ Biopsy day.

It has been stated by recent writers,[6,7] that periodic uterine hemorrhage may occur from any histologic type of endometrium. The findings of this study support this assumption as applicable to the irregular periodic uterine bleeding of the premenopausal epoch. In addition, it is important to note that only five out of the seventeen patients in this group had cyclic hemorrhage following ovulation, such as occurs in the normal menstrual cycle. It appears, therefore, that with failing ovarian function bleeding may occur periodically, irrespective of ovulation.

Conversely, it may be stated that during the premenopause the menstrual disturbance *per se* is no index of the endometrial picture. This must not be construed as decrying the employment of uterine biopsies. The danger of carcinoma is always present, and all patients with abnormal uterine bleeding demand a thorough investigation.

The fact that none of the eight patients with hyperplasia of the endometrium complained of the vasomotor disturbance of the climacteric is of great interest. Such symptoms always have been attributed to an absence of ovarian function, while hyperplasia is due to the action of the estrogenic hormone. The two observations are thus perfectly in keeping and, from a practical standpoint, again point to the error of treating uterine bleeding with estrogenic hormone preparations.

CONCLUSIONS

1. Failing ovarian function is profoundly reflected in the endometrium during the premeno-

pausal period. Cyclic bleeding following normal ovulation was observed only in five out of seventeen cases. In other instances the bleeding occurred from an endometrium corresponding histologically to the stage of proliferation, atrophy, or hyperplasia.

2. The abnormal menstrual bleeding at this time is no index to the underlying endometrial picture.

3. Hyperplasia of the endometrium was the most frequent finding and occurred in eight of the twenty cases studied. None of these patients complained of climacteric vasomotor symptoms.

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SPINAL ANESTHESIA*

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AT the California State Prison at San Quentin, in the inclusive period 1913 to 1938, during which period approximately 38,000 men entered the institution, 4,892 general anesthetics were given; 200 of which were with the inhalants, and 4,674 with spinal anesthesia.

The use of the spinal form of anesthesia was more or less forced upon the Medical Department. In 1913 I was appointed chief surgeon of the California Prison. At that time there was a population of about 1,900 men. No provision had been made for a "free" assistant and, as I was the only doctor on the staff, I had to use one of the prisoners to give ether anesthesia whenever major surgery was required. This prisoner was a dipsomaniac. Following an operation he would purloin whatever alcohol might be left unguarded and would become intoxicated. Because of this it was necessary to discharge him from this duty. It then devolved upon me to not only give the anesthetic, but to do the operating. Spinal anesthesia offered a solution for this situation. As a result, spinal anesthesia has been used almost entirely for all operations below the nipple line at this prison during the past twenty-five years.

The summary does not include over 150 operations performed in the hospital on free people living outside the prison.

For the March, 1915, issue of the *California State Journal of Medicine* I wrote a paper on spinal anesthesia, based on 150 operations. In reviewing this article, one cannot but be impressed by the similarity in technique and results of twenty-five years ago and those found valuable at the present time.

Summary of Operations, 1913-1938

Operations on lower extremities		531
Operations on abdomen:		
Appendectomies	615	
Cholecystectomies	49	
Gastroenterostomies	115	
Herniotomies	1,100	
Miscellaneous	40	
		1,919
Operations on anus		921
Genito-urinary operations and examinations		893
Miscellaneous operations		410
Total		4,674

ANESTHETIC AGENTS

In the early years tropococain was used, but during the World War this could not be obtained and novocain or procain was substituted, and has been used continuously since.

The procain ampoules are prepared in our own laboratory. Two grains of the powdered drug are placed in the bottom of a long-size dram vial. The top is sealed over with a Bunsen burner. The ampoules are then sterilized in the autoclave.

PREOPERATIVE TREATMENT

The patient is not given any elaborate preoperative medication or sedation. Three-quarters grain of ephedrin is administered fifteen minutes before the time of the operation. The purpose of this is to keep up the blood pressure, which ordinarily falls with spinal anesthesia. Seldom is a sedative given, for it has been found that the patient frequently does better without one. But in nervous patients barbiturates are used. Very little morphin is given in prison. It is used to a minimum, both preoperatively and postoperatively. Nor do the patients often suffer from gas pains after the operation. It is not known whether this is due to the spinal anesthesia or the paucity of morphin.

INJECTION PROCEDURE

The patient is placed on the operating table in the operating room on his left side. An attendant brings the head to the knees, thus bowing the back outwardly. The back is painted with iodin or merthiolate and draped. A spinal needle is inserted in the space between the first and second lumbar spines. It is inserted directly inward, at a right angle to all surfaces.

In inserting the needle it is found best to grasp the needle near its point, with the butt-end of the needle in the palm. In this way the needle may be pushed through the skin without danger of bending or breaking.

The skin is not infiltrated with any anesthetic. The needle enters the dura with a distinct sensation transmitted to the hand of the operator.

On withdrawing the stylet, fluid emerges. A five cubic centimeter Luer syringe is attached, and about three or four cubic centimeters of fluid are removed. A small vial of the fluid is collected for serologic examination.

In the meantime, the ampoule is opened and the fluid in the syringe is mixed with the crystals until

* Read before the Section on Anesthesiology of the California Medical Association at the sixty-eighth annual session, Del Monte, May 1–4, 1939.